ABSTRACT OF THE DISCLOSURE

A disturbance estimated type control system and a gas compressor control system that are insensitive to a parameter variation such as a heat load variation and a rotating speed change and a method of designing a disturbance estimated type control system are provided. A disturbance is applied to a control object. An input signal and an output signal are inputted in an observer and a disturbance is estimated. A deviation between the output signal and a target value is calculated by a subtractor. This deviation is subject to compensations by a compensator and outputted as a control signal. This control signal is subtracted from a disturbance estimated value from the observer by a subtractor. Therefore, the disturbance estimated value among estimated values of the observer is fed back so as to cancel an actual disturbance.